

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-097098

(43)Date of publication of application : 11.04.1995

(51)Int.Cl.

B65H 7/14
B41J 11/42
B41J 13/00

(21)Application number : 05-260388

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(22)Date of filing : 27.09.1993

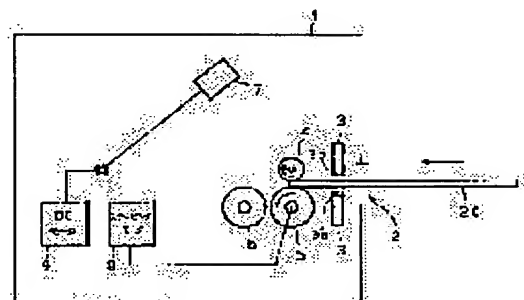
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(54) PRINTING DEVICE

(57)Abstract:

PURPOSE: To enable presentable printing always regardless of the size of sheets by grasping the size of a printing sheet, and adjusting a printing start position on the basis of this size.

CONSTITUTION: In the inserted state of a sheet 20, a CPU rotates a feed roller 5 in the intake direction by a stepping motor 8. During this intake action, the stepping number of the stepping motor 8 is counted by a counter, and when the rear end of the sheet 20 passes the position of a sensor 3, the driving of the motor 8 is stopped and the count number is confirmed. Hereupon, whether the sheet size is sufficient in relation to the size of a printed image is discriminated. In the case of the sheet 20 being of the printable size, the adjustment quantity is computed so that printing is at the center of the sheet face, for instance, on the sheet 20. The stepping motor 8 is driven by this adjustment quantity, and after the sheet 20 is fed into a printing start position, a printing head 7 is brought into contact with the sheet 20 by a DC motor 9 to start a printing process.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's
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CLAIMS

[Claim(s)]

[Claim 1] In the printing equipment which can perform printing actuation to the inserted print sheet An edge detection means by which the edge of a print sheet is detectable, and a paper feed means to perform inhalation and discharge of a print sheet, Print sheet size is distinguished from the feed per revolution by said paper feed means to the form end position of the print sheet detected by said edge detection means. The printing equipment characterized by having the control means which computes the printing starting position on a print sheet based on the print sheet size, drives said paper feed means so that printing may be started from the printing starting position concerned, and adjusts the location of a print sheet.

[Claim 2] It is the printing equipment according to claim 1 characterized by having the form inhalation / exhaust port made to serve a double purpose as the inhalation section and the discharge section of a print sheet, allotting said edge detection means between said form inhalation / exhaust ports, and paper feed means, and being constituted so that the existence of a print sheet may be detected.

[Claim 3] Said control means is a printing equipment according to claim 1 characterized by controlling not to perform printing when not fulfilling the space size which needs the distinguished print sheet size for printing.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the printing equipment which prints an image etc.

[0002]

[Description of the Prior Art] Usually, in the printing equipment, the printing starting position is set up regardless of the size (especially size of the feed direction of a form) of a print sheet. For example, a printing starting position is set up as a location of what mm from the tip of a form, and printing is performed.

[0003]

[Problem(s) to be Solved by the Invention] Although such a setup is not a problem especially in the printing equipment with which the paper size is decided, un-arranging arises in the printing equipment which a user can print using the form of to some extent arbitrary sizes.

[0004] For example, the printing equipment which can print on a postcard etc. the image which the user created is considered. For example, in consideration of 148x100mm which is the standard size of a postcard, printing image size presupposes that it is set up with 109x76mm. in this case — if it thinks that the form (for example, postcard) of standard size is always inserted in a printing equipment, and it is printed and printing will be started in the location of 20mm from the tip of a form with a die length [that] of 148mm — drawing 10 (a) — like — that printing image (slash section PD) — a postcard (form P) — do in the center mostly — it becomes what has good appearance.

[0005] However, when not only the postcard of standard size but a user wants to print on the postcard by which die-length sizes differ, or when it seems that a user wants to create a card etc. using the form of the size of arbitration, there is a problem that a printing image will be made in a good location.

[0006] For example, the printing image PD shown that Form P is long as the slash section to Form P like drawing 10 (b) serves as a location which inclined toward the point, and when Form P is short, like drawing 10 (c), the printing image PD is made in the location which inclined toward the back end section, and becomes what has appearance bad [all].

[0007] Moreover, as a big problem, although printing is made on the form by which a pressure welding is carried out between the print head and a platen roller, when a form is short and all forms have been sent ahead of the print head during printing, it may be referred to as that printing will be made on a platen roller here. For example, when it is not able to print in the short form P like drawing 10 (d), the print which remains (broken-line part) will be made on a platen roller, and a platen roller will be soiled greatly. The dirt of a platen roller will soil the form inserted after that, or will cause the fall of a roller function.

[0008]

[Means for Solving the Problem] This invention aims at preventing printing of a up to [a platen roller] while it was made in view of such a trouble and can perform decent printing in location to the various forms of the size of arbitration.

[0009] For this reason, it sets to the printing equipment which can perform printing actuation to

the inserted print sheet. An edge detection means by which the edge of a print sheet is detectable, and a paper feed means to perform inhalation and discharge of a print sheet, Print sheet size is distinguished from the feed per revolution by the paper feed means to the form end position of the print sheet detected by the edge detection means. Based on the print sheet size, the printing starting position on a print sheet is computed, and the control means which drives a paper feed means and adjusts the location of a print sheet so that printing may be started from the printing starting position concerned is established.

[0010] Here, it has the form inhalation / exhaust port made to serve a double purpose as the inhalation section and the discharge section of a print sheet, and an edge detection means is constituted so that it may be allotted between form inhalation / exhaust port, and a paper feed means and the existence of a print sheet may be detected.

[0011] Moreover, a control means is made to control not to perform printing, when not fulfilling the space size which needs the distinguished print sheet size for printing.

[0012]

[Function] By grasping the size of a print sheet and adjusting a printing starting position based on the size, it cannot be concerned with the size of a form but always decent printing can be performed.

[0013] Moreover, the size of the form inserted by the paper feed means is correctly detectable with an easy configuration based on the feed per revolution by the paper feed means until an edge detection means detects form end position by allotting the edge detection means between form inhalation / exhaust port, and the paper feed means.

[0014] Furthermore, when the distinguished paper size does not fulfill size required as a print sheet, it is stopping printing, and it can prevent that printing will be made by the platen roller.

[0015]

[Example] Hereafter, drawing 1 - drawing 9 explain one example of this invention. Drawing 1 shows the structure of the printing equipment of an example typically. Form opening for 1 showing the whole printing equipment, and 2 inserting a form in this printing equipment 1, and discharging a form is shown.

[0016] The sensor 3 which detects the existence of the form in the location is formed in the interior of the form opening 2. A sensor 3 is formed of light emitting diode 3a and photo transistor 3b, and is made as [receive / light / by photo transistor 3b / the output light from light emitting diode 3a]. Therefore, when the light-receiving detection output by photo transistor 3b is not obtained when a form exists in the gap parts of this light emitting diode 3a and photo transistor 3b, and a form does not exist, the light-receiving detection output by photo transistor 3b will be obtained, and this can detect the existence of the form in that location.

[0017] A pinch roller 4 and a feed roller 5 are formed in the method of inside as carriage from a sensor 3. A feed roller 5 rotates with a stepping motor 8. When the form is inserted, the pressure welding of the form is carried out by the feed roller 5 and the pinch roller 4 from vertical side both sides, therefore if a feed roller 5 rotates leftward (counterclockwise rotation) in drawing with a stepping motor 8, a form will be sent in the inhalation direction, and when a feed roller 5 rotates in the direction of drawing Nakamigi (clockwise rotation) with a stepping motor 8, a form will be sent to an eject direction.

[0018] 6 shows a platen, 7 shows the print head, and the print head 7 is made as [move / by DC motor 9 / the location / between the location shown as a continuous line, and the position in readiness shown with an alternate long and short dash line]. If the print head 7 is made into the location shown as a continuous line in case a form is on a platen 6, a form will be ****(ed) by a platen 6 and the print head 7, and printing by the print head 7 will be performed by form space in this condition.

[0019] Drawing 2 shows the internal circuitry of this printing equipment 1, and shows a counter [in / 10 and / in 11 / the interior of CPU]. [a control section (CPU)] CPU10 is made as [distinguish / by incorporating the detection output by the sensor 3, i.e., the output of photo transistor 3b / the trailer of the form inserted]. Moreover, CPU10 also performs drive control to DC motor 9 and a stepping motor 8. In case drive control of a stepping motor 8 is performed, it is constituted so that the number of steps can be counted with a counter 11.

[0020] In this printing equipment 1, CPU10 will perform processing of drawing 3 at the time of printing actuation. Hereafter, drawing 3 and drawing 4 – drawing 8 explain printing actuation. As for printing actuation, a user operates the actuation switch which is not illustrated after inserting a form from the form opening 2, and it is made to be started in the actuation information being inputted into CPU10. In addition, a user inserts a form from the form opening 2, and when a sensor 3 detects existence of a form, you may make it started automatically.

[0021] For example, when a user inserts a form from the form opening 2, as shown in drawing 4, the tip of the form 20 will be pushed in to the gap parts of a feed roller 5 and a pinch roller 4. Here, if a user performs printing actuation, as for CPU10, the information from a sensor 3 will detect the existence of a form 20 first (F101). When a user performs printing actuation in the condition that the form 20 is not inserted, it is judged at step F101 that he has no form, and printing actuation is not performed. That is, it progresses to step F113 and printing termination processing and form discharge processing (drive of the eject direction of a feed roller 5) are performed.

[0022] In the state of drawing 4 in which the form 20 was inserted, processing will progress to step F102, and with a stepping motor 8, as for CPU10, a feed roller 5 is rotated in the inhalation direction, as the drawing Nakaya mark shows. And in CPU10, the number of steps of a stepping motor 8 will be counted with the counter 11 during this inhalation actuation (F103).

[0023] inhalation and the number-of-steps count of a form 20 are continued till the time (at the back end detection time of a form 20) of the back end of a form 20 passing through the location of a sensor 3 like drawing 5, that is, having no form being detected by the sensor 3 (F103, F104) — processing of CPU10 progresses to step F105 at the time of this drawing 5, and the drive of a stepping motor 8 is stopped. And the number of counts in the counter 11 at the time is checked.

[0024] It becomes a numeric value for grasping the size of the number of counts 20 at this time, i.e., the inserted form. If a form 20 sets to c die length inhaled at one step of a stepping motor 8, sets the number of counts to X and sets distance from a sensor 3 to a feed roller 5 to b like drawing 5, it is the size SP of the inhalation direction of a form. It is computable as $SP = (cX+b)$. Here, it is size SP to the size of a printing image. It distinguishes whether it is enough (F106). the size of a printing image is 109mmx76mm — carrying out — contact location (printing position) PS of a feed roller 5 to the print head 7 up to — if distance is set to a — size SP of the inhalation direction of a form The above (109+a) is indispensable.

[0025] Since the maximum inhalation location of a form turns into a location where the back end of a form 20 is pinched by the feed roller 7 and the pinch roller 4 (discharging will become impossible if it inhales more than it), the part of a will be because all printing images cannot be printed on a form 20, if printing will not be possible, therefore (109+a) does not have the above size.

[0026] when it is distinguished that it is the size ($SP < (109+a)$) which cannot print the inserted form 20 by this step F106, it will progress to step F113, printing will be stopped, drawing Nakamigi rotation of the feed roller 5 will be carried out by the step INGU motor 8, and a form 20 will be discharged.

[0027] By this processing, it is prevented by performing printing, while the size of a form 20 has been insufficient that printing will be performed on a platen 6. In addition, the decision with an actual enough/inadequate paper size is number-of-steps SP, even if it does not compute form height specially at this time, since distance a is a fixed value and printing image size is also immobilization in that printing equipment at this time. What is necessary is just to compare with a predetermined value.

[0028] When it considers as the size which can print a form 20 next, processing by which printing is made on a form 20 in a decent location (for example, center of space) will be performed. That is, the printing position PS It receives, and the printing starting position on space is computed and form justification is carried out. if printing is made by the part of drawing 5 which attached the slash as a location of a feed direction in the form 20 — a printing image — a form 20 — it will be mostly made in the center. Therefore, the location of a form 20 is adjusted as shown in drawing 6 (in the case of this example, predetermined length inhalation is carried out further),

and it is the printing position PS. It adjusts so that the printing starting position on space may face.

[0029] Here, if the die length (109mm in the above-mentioned example) of Y and a printing image is set to Z for the feed per revolution (number of steps of a stepping motor 8) of the form 20 for this adjustment actuation, feed-per-revolution Y for adjustment can compute the amount Y of adjustments for printing in the center of space as $Y = (X \text{ and } c + b - Z) / 2 - a / c$.

[0030] Thus, if the amount Y of adjustments is computed (F107), only the Y step will drive a stepping motor 8 (F108), and will make a form 20 the location condition of drawing 6. In addition, according to die-length Z of a printing image, it is set further, and the paper feed for adjustment may become [the distance of a / in / in Y at this time / the size X and each equipment of a form /, and b, and] both the inhalation direction and an eject direction (Y becomes a forward value or a negative value).

[0031] Thus, if a form is sent to inhalation or an eject direction by adjustment number-of-steps Y, the print head 7 will be made to contact a form 20 like drawing 6 with DC motor 9 (F109), and printing processing will be started (F110). That is, a feed roller 5 is rotated in the drawing Nakaya mark direction like drawing 7, and the form 20 prints by the print head 7 with delivery to the eject direction. and a printing image — if all printed (F111), like drawing 8, the print head 7 is returned to a position in readiness, a form 20 will be discharged and printing actuation will be finished so that it may illustrate further.

[0032] the above printing actuation — a user — ***** — even if it inserts the form of size and performs printing, it is shown, for example in drawing 9 (a) - (b) — as — the printing image (slash section) PD — space — do to a mid gear mostly — the balance to a form becomes the good thing which has good appearance.

[0033] In addition, although printing was made in the center of space abbreviation in the above example while considering printing image size as immobilization, it is also possible to adjust, for example by setting actuation of a user, so that it may become the location which changed printing image size or shifted the printing position on a form from the center purposely. What is necessary is just to change the value of Z in the formula which asks for Above Y according to the setup, when printing image size is changed. Moreover, what is necessary is just to adjust the numeric value according to the amount of gaps also by setup which shifts the printing position purposely. $Y = \{(X - c + b - Z) / 2 - a + \alpha\}$ What is necessary is just to set up the value of alpha as /c according to a setup of inhalation or the amount of gaps of an eject direction.

[0034] Moreover, various modification is possible for the structure as a printing equipment besides an example. For example, it has the motor which replaces with counting the number of steps of a stepping motor 8, and has the pulse generating sections, such as FG and PG, pulse count is performed, and you may make it grasp a paper size.

[0035]

[Effect of the Invention] The printing equipment of this invention grasps the size of a print sheet as having explained above, and by adjusting a printing starting position based on the size, it is not concerned with the size of a form but is effective in the ability to perform always decent printing. Moreover, the size of the form inserted by the paper feed means is correctly detectable with an easy configuration based on the feed per revolution by the paper feed means until an edge detection means detects form end position by allotting the edge detection means between form inhalation / exhaust port, and the paper feed means. Furthermore, when the distinguished paper size does not fulfill size required as a print sheet, it is stopping printing, and it is effective in the ability to prevent that printing will be made by the platen roller, and can prevent that the form by the dirt of a platen roller being soiled and a malfunction occur.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the explanatory view of the structure of one example of the printing equipment of this invention.

[Drawing 2] It is the explanatory view of a circuit block of the printing equipment of an example.

[Drawing 3] It is the flow chart of the printing motion control of the printing equipment of an example.

[Drawing 4] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 5] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 6] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 7] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 8] It is the explanatory view of printing actuation of the printing equipment of an example.

[Drawing 9] It is the explanatory view of the printing image by the printing equipment of an example.

[Drawing 10] It is the explanatory view of the printing image by the conventional printing equipment.

[Description of Notations]

- 1 Printing Equipment
- 2 Form Opening
- 3 Sensor
- 4 Pinch Roller
- 5 Feed Roller
- 6 Platen
- 7 Print Head
- 8 Stepping Motor
- 9 DC Motor
- 10 CPU
- 11 Counter
- 20 Form

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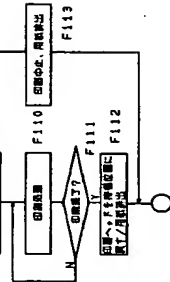
(5)Int.Cl.	識別記号	庁内整理番号	FI	技術表示箇所
B 65 H 7/14		9037-3F		
B 41 J 11/42		M		
13/00				
(21)出願番号	特願平5-260388	(71)出願人	000002185	技術表示箇所
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(54)【発明の名称】 プリント装置

(57)【要約】

【目的】 任意のサイズの各種用紙に対して位置的に体裁のよい印刷を行なうとともに、プラテンローラ上への印刷を防止する

【構成】 用紙の端部を突出する端部後出手段と、用紙の吸入/排出を行なう紙送り手段と、端部後出手段によって突出される印刷用紙の用紙端位置までの紙送り手段による送り量から印刷用紙サイズを判別し、(F103~F110)5)、その印刷用紙サイズに基づいて印刷用紙上の印刷開始位置を算出し(F107)、当該印刷開始位置から印刷を開始されるように紙送り手段を駆動して印刷用紙の位置を調整する(F108)制御手段とを設けるようにする。端部後出手段は、用紙吸入/排出口と紙送り手段の間に配して印刷用紙の有無を検出するようにする。また制御手段は、印刷された印刷用紙サイズが印刷に必要な紙面サイズに満たない場合は、印刷を実行しないように制御を行なうようにする(F106~F113)。



【特許請求の範囲】

【請求項1】 挿入された印刷用紙に対して印刷動作を行なうことができるプリント装置において、印刷用紙の端部を突出することができる端部後出手段と、

印刷用紙の吸入及び排出を行なう紙送り手段と、前記端部後出手段によって突出される印刷用紙の用紙端位置までの前記紙送り手段による送り量から印刷用紙サイズを判別し、その印刷用紙サイズに基づいて印刷用紙上の印刷開始位置を算出し、当該印刷開始位置から印刷を開始されるように前記紙送り手段を駆動して印刷用紙の位置を調整する制御手段と、

【請求項2】 印刷用紙の吸入部と排出部として兼用された用紙吸入/排出口を備え、前記端部後出手段は、前記用紙吸入/排出口と紙送り手段の間に配されて、印刷用紙の有無を検出するように構成されていることを特徴とする請求項1に記載のプリント装置。

【請求項3】 前記制御手段は、印刷された印刷用紙サイズが印刷に必要な紙面サイズに満たない場合は、印刷を実行しないように制御を行なうことを特徴とする請求項1に記載のプリント装置。

【発明の詳細な説明】

【産業上の利用分野】 本発明は画像等の印刷を行なうプリント装置に関するものである。

【0001】

【従来の技術】 通常、プリント装置では、印刷用紙のサイズ（特に用紙の送り方向のサイズ）とは無関係に印刷開始位置が設定されている。例えば用紙の先端から何mmの位置として印刷開始位置が設定され、印刷が行なわれる。

【0003】

【発明が解決しようとする課題】 このような設定は用紙サイズが決められているプリント装置においては特に問題ではないが、ユーザーがある程度任意なサイズの用紙を用いて印刷できるプリント装置においては不都合が生じる。

【0004】 例えばユーザーが作成した画像を葉書などに印刷できるプリント装置を考える。例えば葉書の標準サイズである148×100mmを考慮して、印刷画像サイズは109×76mmと設定されているとする。この場合、常に標準サイズの用紙（例えば葉書）がプリント装置に挿入され印刷されると考えれば、その長さ148mmの用紙の先端から例えば20mmの位置において印刷が開始されるようにすれば、図10(a)のようには中央にずれ、体裁のよいものとなる。

【0005】 ところが、標準サイズの葉書に限らず、ユーザーが任意サイズの異なる葉書に印刷したい場合や、

或はユーザーが任意のサイズの用紙を用いてカード等を作成したいような場合、印刷画像が良好な位置になされないことになるという問題がある。

【0006】 例えば用紙Pが長いものであると図10(b)のように用紙Pに対して、斜線部として示す印刷画像PDは先端部に偏った位置となり、また用紙Pが短いものの場合、図10(c)のように印刷画像PDは後端部に偏った位置になされ、いずれも体裁の悪いものとなる。

【0007】 また、印刷は、印刷ヘッドとプラテンローラの間に圧接される用紙上になされるものであるが、ここで大きな問題として、用紙が短いものであって、印刷中に用紙が全て印刷ヘッドより先に送られてしまった場合、プラテンローラ上に印刷がなされてしまうということがある。例えば図10(d)のように短い用紙Pにおいて印刷しきれなかった場合、残りの（破線部分）の印刷はプラテンローラ上になされてしまい、プラテンローラは甚だしく汚されてしまう。プラテンローラの汚れはその後に入力された用紙を汚したり、ローラ機能の低下を招くことになる。

【0008】

【課題を解決するための手段】 本発明はこのような問題点にかんがみ行なわれたもので、任意のサイズの各種用紙に対して位置的に体裁のよい印刷を行なうことができるとともに、プラテンローラ上への印刷を防止することを目的とする。

【0009】 このために、挿入された印刷用紙に対して印刷動作を行なうことができるプリント装置において、印刷用紙の端部を突出することができる端部後出手段と、印刷用紙の吸入及び排出を行なう紙送り手段と、端部後出手段によって突出される印刷用紙の用紙端位置までの紙送り手段による送り量から印刷用紙サイズを判別し、その印刷用紙サイズに基づいて印刷用紙上の印刷開始位置を算出し、当該印刷開始位置から印刷を開始されるように紙送り手段を駆動して印刷用紙の位置を調整する制御手段とを設けるようにする。

【0010】 ここで、印刷用紙の吸入部と排出部として兼用された用紙吸入/排出口を備えるようにし、端部後出手段は、用紙吸入/排出口と紙送り手段の間に配されて印刷用紙の有無を検出するように構成する。

【0011】 また、制御手段は、印刷された印刷用紙サイズが印刷に必要な紙面サイズに満たない場合は、印刷を実行しないように制御を行なうようにする。

【0012】

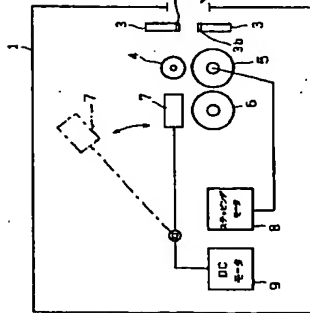
【作用】 印刷用紙のサイズを把握してそのサイズに基づいて印刷開始位置を調整することにより、用紙のサイズに関わらず常に体裁のよい印刷を行なうことができる。

【0013】 また、端部後出手段が用紙吸入/排出口と紙送り手段の間に配されていることにより、紙送り手段によって挿入されていく用紙のサイズは、端部後出手段

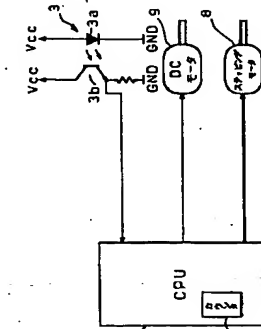
- 【図5】実施例のプリント装置の印刷動作の説明図である。
 【図6】実施例のプリント装置の印刷動作の説明図である。
 【図7】実施例のプリント装置の印刷動作の説明図である。
 【図8】実施例のプリント装置の印刷動作の説明図である。
 【図9】実施例のプリント装置による印刷画像の説明図である。
 【図10】従来のプリント装置による印刷画像の説明図である。
 【符号の説明】

1 プリント装置
 2 用紙口
 3 センサ
 4 ペンチローラ
 5 フィードローラ
 6 ブラテン
 7 印刷ヘッド
 8 ステッピングモータ
 9 DCモータ
 10 CPU
 11 カウンタ
 20 用紙

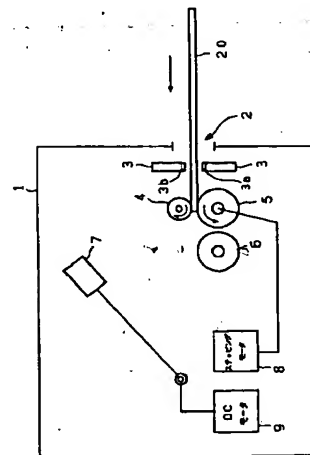
【図1】



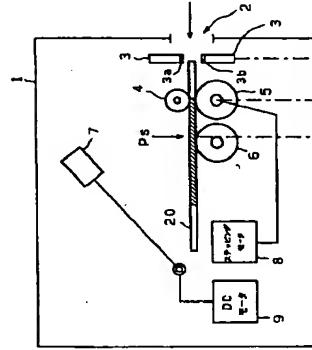
【図2】



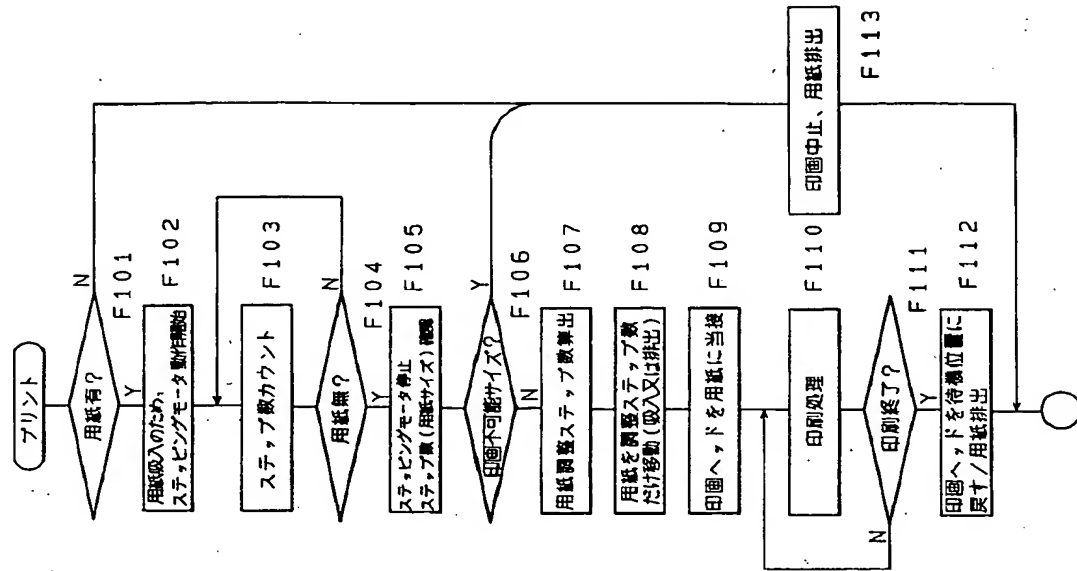
【図4】



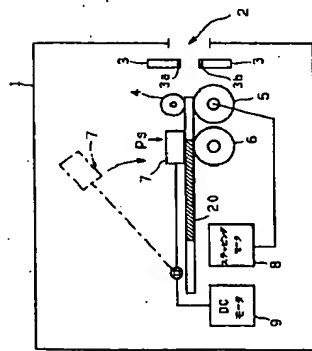
【図5】



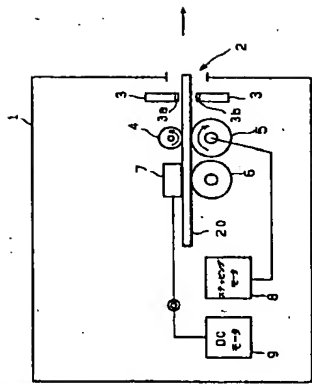
【図3】



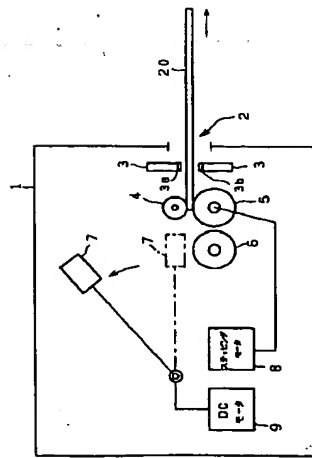
【図6】



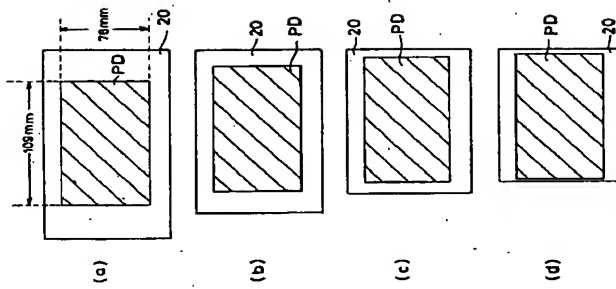
【図7】



【図8】



【図9】



【図10】

